

CLAIMS

1. A method for manufacturing SOI wafers in which a laminated wafer is formed by laminating an active layer wafer to a base wafer with an insulating film interposed therebetween, followed by reducing the thickness of the active layer wafer side to produce an SOI wafer, comprising the steps of:
 - implanting oxygen ions into the active layer wafer to form an oxygen ion implanted layer on the active layer wafer;
 - reducing the oxygen in the vicinity of the surface layer of the active layer wafer by out diffusion by heat treating the active layer wafer on which the oxygen ion implanted layer has been formed in a reducing atmosphere;
 - forming a laminated wafer by laminating the active layer wafer onto a base wafer with an insulating film interposed therebetween;
 - allowing a portion of the active layer wafer to remain on the surface side of the oxygen ion implanted layer by grinding the active layer wafer portion of the laminated wafer;
 - exposing the oxygen ion implanted layer by polishing or etching a portion of the remaining active layer wafer;
 - forming an oxide film of a predetermined thickness on the exposed surface of the oxygen ion implanted layer by oxidation treatment of the laminated wafer; and,
 - removing the oxide film.
2. A method for manufacturing SOI wafers in which ions of hydrogen or a noble gas element are implanted in an active layer wafer through an insulating film to form an ion

implanted layer on the active layer wafer, the active layer wafer is laminated to a base wafer with an insulating film interposed therebetween to form a laminated wafer, the laminated wafer is subjected to heat treatment, and a portion of the laminated wafer is separated at the boundary with the ion implanted layer to produce an SOI wafer, comprising the steps of:

injecting oxygen ions from the separated surface of the SOI wafer following separation to form an oxygen ion implanted layer between the separated surface and the insulating film;

exposing the oxygen ion implanted layer by polishing or etching a portion of the active layer wafer from the separated surface to the oxygen ion implanted layer;

forming an oxide film of a predetermined thickness on the exposed surface of the oxygen ion implanted layer by subjecting the SOI wafer to oxidation treatment; and, removing this oxide film.

3. The method for manufacturing SOI wafers according to claim 1 wherein, the oxygen dose in the step for forming the oxygen ion implanted layer is $5.0\text{E}16$ to $5.0\text{E}17$ atoms/cm².

4. The method for manufacturing SOI wafers according to claim 2 wherein, the oxygen dose in the step for forming the oxygen ion implanted layer is $5.0\text{E}16$ to $5.0\text{E}17$ atoms/cm².

5. The method for manufacturing SOI wafers according to claim 1 or claim 3 wherein, the step for forming the oxygen ion implanted layer is carried out by polishing

a portion of the active layer wafer while supplying an abrasive having an abrasive particle concentration of 1% by weight or less.

6. The method for manufacturing SOI wafers according to claim 1 or claim 3 wherein, the step for forming an oxygen ion implanted layer is carried out by etching a portion of the active layer wafer using an alkaline etching solution.

7. The method for manufacturing SOI wafers according to claim 2 or claim 4 wherein, the step for forming the oxygen ion implanted layer is carried out by polishing a portion of the active layer wafer while supplying an abrasive having an abrasive particle concentration of 1% by weight or less.

8. The method for manufacturing SOI wafers according to claim 2 or claim 4 wherein, the step for forming an oxygen ion implanted layer is carried out by etching a portion of the active layer wafer using an alkaline etching solution.